

U.S. Patent Application Serial No. **10/803,894**
Amendment filed March 28, 2007
Reply to OA dated January 3, 2007

AMENDMENTS TO THE CLAIMS:

Claims 1-12 and 14-20 are presented for examination. Claim 1 has been amended.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method for manufacturing a polymerized toner comprising

a process for forming fine droplets of a polymerizable monomer composition containing a polymerizable monomer and a colorant, in an aqueous dispersion medium, and

a process for polymerizing the polymerizable monomer composition after the process for forming fine droplets; wherein, the process for forming fine droplets comprising the steps of:

step (1) preparing an agitating apparatus having an agitator equipped with an agitating blade or rotor and a dispersion supply tank, said dispersion supply tank being connected with the agitator through a line;

step (2) providing a polymerizable monomer composition and an aqueous dispersion medium into the dispersion supply tank; and;

step (3) mixing the polymerizable monomer composition and the aqueous

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dispersion medium by the agitator under controlled agitation to obtain a dispersion of fine droplets;

step (4) feeding back the dispersion from the outlet port of the agitator through a line into the dispersion supply tank and circulating the dispersion; the agitation being controlled by the following parameters:

$R/\theta \geq 2$, and

$R \geq 30$ m/s or more,

wherein the peripheral velocity (m/s) of the agitating blade or rotor of the agitator is designated by R, and the number of circulations is designated by θ ; θ being represented by (throughput of the dispersion (liter/h) x agitating time (h))/(provided quantity in step (2) of the polymerizable monomer composition and the aqueous dispersion medium (liter)); the throughput being the amount of dispersion that is fed back into the dispersion supply tank in step (4); θ being ≥ 1 ; and the internal pressure of the agitator is controlled within a range between 0.01 and 15 MPa; and
step (5) providing the resulting dispersion to the process for polymerizing.

Claim 2 (Original): The manufacturing method according to claim 1, wherein the polymerizable monomer composition and the aqueous dispersion medium are mixed together to form the blend thereof before providing them into the dispersion supply tank.

Claim 3 (Original): The manufacturing method according to claim 2, wherein the

blend is formed as to include uniform primary droplets of the polymerizable monomer composition.

Claim 4 (Original): The manufacturing method according to claim 1, wherein the peripheral velocity R of the agitating blade or rotor is within the range between 30 and 100 m/s.

Claim 5 (Original): The manufacturing method according to claim 4, wherein the peripheral velocity R of the agitating blade or rotor exceeds 35 m/s.

Claim 6 (Original): The manufacturing method according to claim 4, wherein the peripheral velocity R of the agitating blade or rotor is 40 m/s or more.

Claim 7 (Original): The manufacturing method according to claim 1, wherein the number of circulations θ is within the range between 1 and 20.

Claim 8 (Original): The manufacturing method according to claim 1, wherein R/θ is within the range between 2 and 100.

Claim 9 (Previously Presented): The manufacturing method according to claim 1, wherein the agitator is a dispersing machine having a combination of a stator and a

rotor that are concentric comb-teeth rings,

rotating the rotor at a high speed to flow the blend of the polymerizable monomer composition and the aqueous dispersion medium from the inside of the rotor to the outside of the stator, and

agitating the blend through the gap between the rotor and the stator.

Claim 10 (Original): The manufacturing method according to claim 9, wherein the combination of the stator and the rotor is placed in a housing and the rotor is driven with an agitating shaft.

Claim 11 (Original): The manufacturing method according to claim 9, wherein the dispersing machine has the plural combinations of rotors and stators disposed in one to three stages.

Claim 12 (Original): The manufacturing method according to claim 9, wherein the dispersing machine is a vertical or horizontal dispersing machine with capacity of the peripheral velocity R of the rotor higher than 35 m/s.

Claim 13 (Cancelled):

Claim 14 (Original): The manufacturing method according to claim 1, wherein

the agitator forms the fine droplets by the actions of shearing force, collision force, pressure fluctuation, cavitations, and potential cores, generated between the rotor rotating at a high speed and a screen surrounding the rotor.

Claim 15 (Previously Presented): The manufacturing method according to claim 1, wherein the agitator forms the fine droplets by compressing the dispersion to an internal wall of the agitator with a centrifugal force to form a liquid film and to touch the liquid film with the edges of the agitating blade or rotor rotating at an ultra-high speed.

Claim 16 (Previously Presented): The manufacturing method according to claim 1, wherein, in the process of forming fine droplets, the fine droplets of the polymerizable monomer composition has a volume average particle diameter of 3 to 10 μm .

Claim 17 (Previously Presented): The manufacturing method according to claim 1, wherein, in the process of forming fine droplets, the fine droplets of the polymerizable monomer composition has a particle diameter distribution of 1 to 2.

Claim 18 (Previously Presented): The manufacturing method according to claim 1, wherein, in the process of forming fine droplets, the fine droplets of the

polymerizable monomer composition are formed in an aqueous dispersion medium containing a colloid of a hardly water-soluble metal hydroxide as a dispersion stabilizer.

Claim 19 (Previously Presented): The manufacturing method according to claim 1, wherein, in the process of polymerizing, the obtained colored polymer particles has having

a volume average particle diameter dv of 4 to 9 μm , the

a ratio dv/dp of the volume average particle diameter dv to the number average particle diameter of 1.25 or less, and

a number percentage of particles having a volume average particle diameter dv of 3 μm or smaller of 8% or less.

Claim 20 (Previously Presented): The manufacturing method according to claim 1, wherein, in the process of polymerizing, core-shell structure colored polymer particles is obtained by

polymerizing the polymerizable monomer composition to form colored polymer particles, using the colored polymer particles as core particles, and

further polymerizing a polymerizable monomer for shell in the presence of the core particles to form polymer layer on the surface of the core particles.